RAMP AND PLATFORM HARBOR ACCESS SYSTEM

FIELD OF THE INVENTION

This invention pertains to a ramp and platform harbor access system; more specifically, to a system incorporating multiple floating platforms with interconnecting ramps leading to a dock below, configured so that the ramps never exceed a predetermined slope.

BACKGROUND OF THE INVENTION

The use of a single ramp from the shore to a floating dock below is a typical method of harbor access. This method usually allows some access to the dock at all tides. When the tide is high, the slope of the ramp may be gentle enough to provide access for large loads and disabled people. However, during low tide, as the dock level drops relative to the land, the slope of the ramp may be dangerous for anyone. The problem is amplified in inclement weather and with large tidal variations. In an attempt to deal with this problem, longer ramps have been used thereby reducing the ramp slope change relative to the dock level change. However, a ramp long enough to maintain a gentle slope may be infeasible due to harbor configuration, the difficulty a disabled person may have climbing such a long ramp without places to rest along the way, and the complexity and weight of such a ramp. Thus, harbor access in areas of large water-level variations can be difficult, especially for those using wheelchairs, crutches, or braces, or those carrying loads.

The maximum ideal slope for persons using wheelchairs, crutches, or braces is 4.8 degrees, i.e., 1:12 rise over run, equating to an 8.33% grade. Hence, a tidal variation of 25 feet would require a 300 foot ramp to maintain a 4.8 degree slope. Conventional harbor access ramps may not attain such a gentle slope even at highest tide.

Prior art mooring or harbor access systems designed to maintain a gentle slope with changes in water level must be manually readjusted when the water level changes more than a few feet. One typical system utilizes two interconnected ramps, the first of which extends from shore and is manually adjustable along a pencil anchor. The second ramp is pivotally connected to the first ramp on its landward end while its waterward end rides upon the floating dock. The slope of the first ramp can be manually changed to accommodate a drastic change in water level (i.e., more than a few feet). This prior art system deals with small changes in water level due to waves but cannot adequately deal with constant large changes such as tides. Manual readjustment would be a difficult and infeasible task on a body of water with a constantly and broadly changing level, such as ocean waters.

SUMMARY OF THE INVENTION

The present invention overcomes the drawbacks of conventional systems, discussed above, by providing a dock access system for controlled access between the shore and a dock for use on variable-level bodies of water. The dock access system includes at least one ramp-platform unit interconnecting the shore with a dock. Each ramp-platform unit includes a buoyant platform having waterward and landward sides; an intermediate ramp having waterward and landward ends, with the waterward end connected to the landward side of the buoyant platform; a plurality of pilings slidably connected to the buoyant platform, wherein the piling connection substantially restricts the horizontal movement of the buoyant platforms while allowing vertical movement thereof; and support structures attached to the pilings, for restricting the movement of the buoyant platform below a predetermined minimum height.

In accordance with other aspects of this invention, the intermediate ramp has a pivot connection at its landward end and a sliding connection at its waterward end. The sliding connection couples the intermediate ramp with the buoyant platform below. The pivot connection couples the intermediate ramp with the shore or another buoyant platform above.

In accordance with further aspects of this invention, the buoyant platform is constructed to ensure that the waterward end of the intermediate ramp is elevated above the landward side of the buoyant platform throughout the range of vertical travel of the platform. This aspect of the invention insures that the ramp does not "see-saw" on the landward edge of the buoyant platform when the ramp is at or near its most horizontal position. The intermediate ramp also has transition plates connected to both ends to ensure there are no severe discontinuities in level at either end of the ramp.

In a preferred embodiment of the invention, the predetermined height to which the buoyant platform is allowed to descend, and which is controlled by the support structures, is such that the maximum slope which the intermediate ramp will attain is 4.8 degrees from horizontal. Thus the dock-access system of the present invention provides for safe access for disabled persons over a wider tidal variation than would otherwise be obtainable.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIG. **1** is a side elevation view of a shore-to-dock access system constructed in accordance with the present invention;

FIG. **2** is a perspective view of a ramp-platform unit supported at a minimum height by support structure beams and pilings in accordance with the present invention;

FIG. **3** is a side elevation view of an alternate embodiment of a shore-to-dock access system constructed in accordance with the present invention and including two platforms with the waterward-most platform floating;

FIG. **4A** is a partial pictorial view of an alternate embodiment of a ramp-platform unit, wherein the waterward edge of the intermediate ramp is supported above the upper surface of the buoyant platform;

FIGS. **4B** and **4C** are partial side elevation views of the ramp-platform unit of FIG. **4A**, with the platform in its lowest and highest positions, respectively;

FIG. **5A** is a partial pictorial view of another alternate embodiment of a ramp-platform unit, wherein lifts are included on the bottom surface of the waterward edge of the ramp; and